

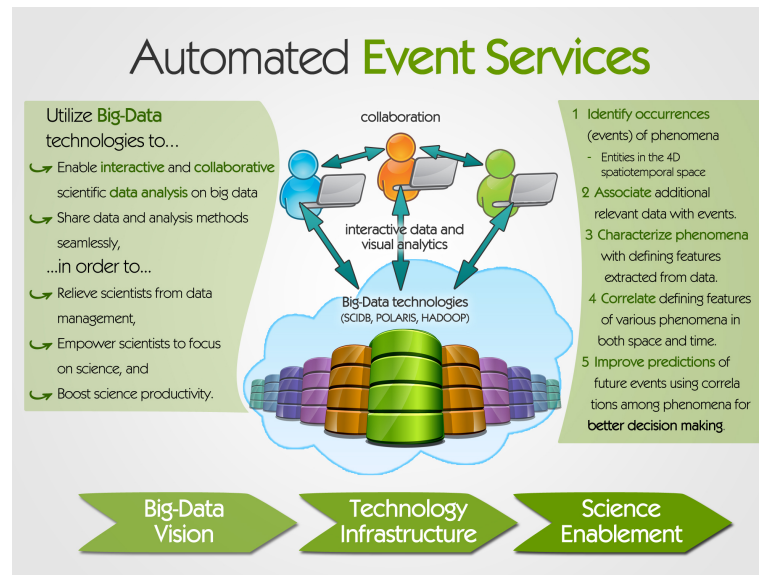
Automated Event Service (AES): Efficient and Flexible Searching for Earth Science Phenomena

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Objective

Develop an Automated Event Service system that:

- Methodically mines custom-defined events (e.g., tornadoes) in the reanalysis data sets of global atmospheric models.
- Enables researchers to specify their custom, numeric event criteria using a user-friendly web interface to search the reanalysis data sets.
- Supports Event Specification Language (ESL) for more flexibility and versatility.
- Contains a social component that enables the dynamic formation of collaboration groups for researchers to cooperate on event definitions of common interest.
- Provides rapid results via high performance computing and advanced search technologies.



Approach

- Leverage advances in high-end computing and search technologies to create an efficient mechanism for searching reanalysis data for events.
- Build baseline system by custom integration of mature components: HPC cluster, MapReduce, Hadoop/Hbase.
- Develop ESL via analysis of representative events.
- Adapt advanced tree-based indexing strategies to efficiently support parameter-based event queries.
- Apply agile methodology: develop in small increments driven by use cases and synthetic tests.

Key Milestones

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| • Import reanalysis data | 10/12 |
| • Implement native indexing | 02/13 |
| • Complete event web service | 05/13 |
| • Complete basic web portal | 11/13 |
| • Complete distributed event database | 02/14 |
| • Design review for ESL | 05/14 |
| • Demonstrate Blizzard use case on 30-node commercial cloud cluster | 07/14 |
| • Complete multifaceted web portal | 11/14 |
| • Complete tree-index search capability | 03/15 |
| • Complete delivery of ESL | 03/15 |
| • Testing and validation | 05/15 |

TRL_{in} = 2 TRL_{current} = 2

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